

Benchmarking OEE

EMI brings packaging line performance analysis to life.
Are you Best-in-Class, Average, or Laggard?

Pat Reynolds, Editor

A leading EMI (Enterprise Manufacturing Intelligence) provider, **Informance International** (www.informance.com), specializes in helping manufacturers improve operations through performance analytics. In a nutshell, they provide real-time manufacturing metrics and pinpoint the underlying inhibitors of line performance. One of those metrics, OEE, has fast become the accepted yardstick that combines availability, performance, and quality to calculate an index showing how efficient a manufacturing operation is.

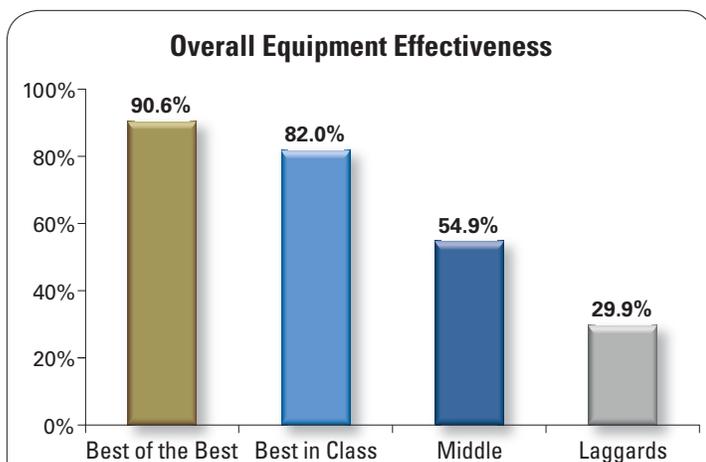
Each year Informance conducts a Manufacturing Benchmark Study, the most recent published in late 2009. Presented here are highlights of that study, which captured packaging line data from 725 consumer packaged goods manufacturing operations around the world. The time period spans January to June 2009, and accounts for 9.1 billion units of production across the 725 operations. Informance declines to identify how many unique companies are represented in the study, but the firm does indicate that it's more than 100.

Worth noting is that the information presented here is not the

result of a survey, where respondents are asked what they think their packaging line OEE is. This data comes straight from a PLC, and the sample size is large enough to make it a pretty accurate reflection of packaging line OEE at CPG companies in general.

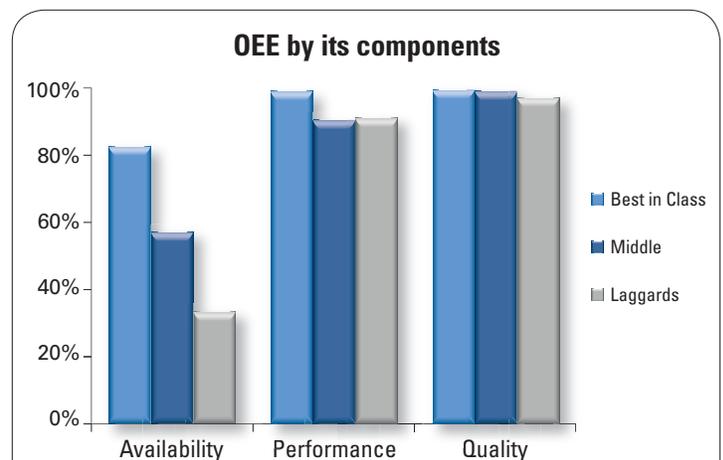
And just how is the data collected? Through a product offering called the Informance Plant Solution. Informance founder and executive vice president John Oskin explains.

"It's a combination of software and instrumentation. We measure real-time production minute by minute by time-stamping items as they move through a factory. The Plant Solution forms a database from the time sequenced information, then analyzes and computes everything from uptime to downtime to quality. Attributes such as SKU information, reasons for downtime, etc. come from the PLCs themselves or an operator on the line." **PW**



Source: Informance, A Solarsoft Company

This chart shows that of all the lines studied, the top 25% (best-in-class) are at 82% OEE, the middle 50% have OEE at 54.9%, and the lowest performers (laggards) are at 29% OEE. It also shows that the "best of the best", the top performing plant, came in at 90.6% OEE. The data has been normalized to reflect two daily shifts over a five-day week. Excluded are the 86 hours not scheduled for production each week.



Source: Informance, A Solarsoft Company

This graph shows how well best-in-class, middle, and laggards perform across the three OEE components. Looking at best-in-class, for example, and how they performed on availability (synonymous for uptime), we see that packaging lines were up and running 82.8% of the time that they were scheduled to be. When it came to performance, best-in-class produced nearly 100% of the number of units that could have been produced during the designated timeframe. As for quality, all three groups scored high in this category, which is defined as the number of final items shipped, divided by the total number of items produced.

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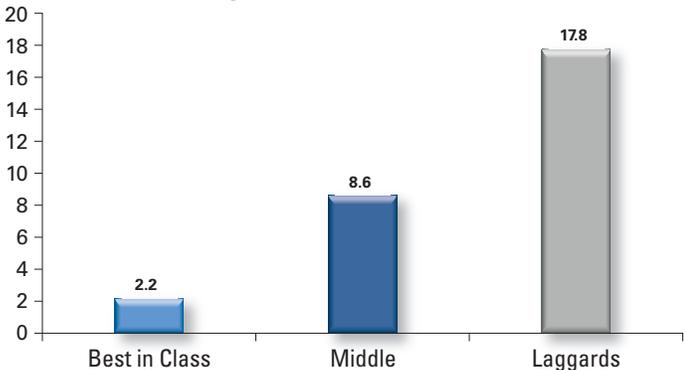
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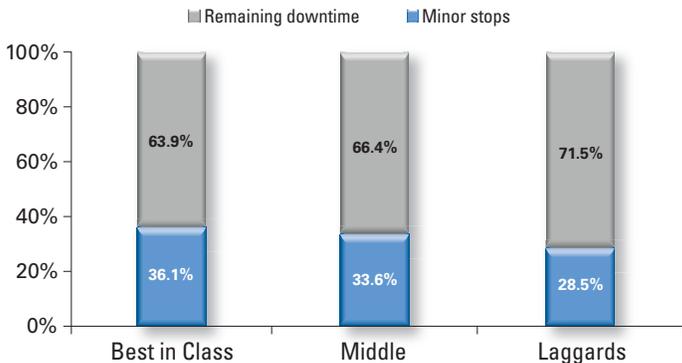
Minor stop index correlated with OEE



Source: Informance, A Solarsoft Company

The minor stop index is a measurement of the number of stops lasting 10 minutes or less each hour. According to the study, on average a line experiences minor stops 8.6 time per hour. In other words, the average line shut down every 7 minutes—label jam, capper jam, a bottle breaks, whatever. This is a number the packaging community should really focus on, say Informance analysts.

Minor stop % of downtime



Source: Informance, A Solarsoft Company

According to the chart above, best-in-class packaging lines owe a greater percentage of their downtime to minor stops than all other groups. Counterintuitive? It seems that if a line is a really good performer, minor stops would be low. But what really happens is that the best OEE performers have solved most major stop issues. What they're left with is minor stops. The message for packagers is that minor stops is going to be an ongoing problem, regardless of OEE. It reinforces the point that minor stops is a major metric that should be given consistent attention.

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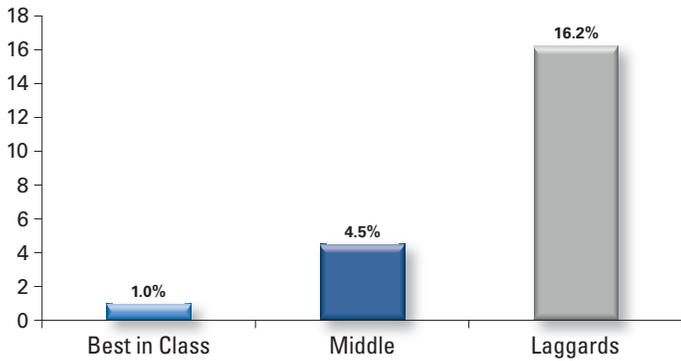
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Benchmarking OEE

Knowledge index correlated with OEE



Source: Informance, A Solarsoft Company

“How much do I really know about my packaging operation?” This graph tells us that on average, all but 4.5% of operating losses have been identified. The point is that best-in-class OEE performers know where 99% of the day went. Laggards on the other hand, have no clue where 16.2% of the day went. Think about it this way—would you rather not know where your 10-year-old kid is 15 minutes of the day, or nearly 4 hours of the day? This level of knowledge in the manufacturing world is just as critical, because you can’t solve problems until you identify them.

Big Six Losses Defined

- **Shutdown Loss:** Preventive maintenance breaks and lunches, training exercises, other miscellaneous production stops.
- **Operational Loss:** Adjustments, material replenishment or related equipment losses, and normal operations that shut down the line.
- **Changeover:** Capacity lost during changes in material, equipment, or product.
- **Equipment Failure:** Equipment unexpectedly becomes dysfunctional or inoperable.
- **Process Failure:** Stops due to defective raw materials, operating errors, lack of raw or packaging material, waiting.
- **Scrap and Rework:** Reprocessing, rework, scrap materials, and stops related to poor quality of the final product.



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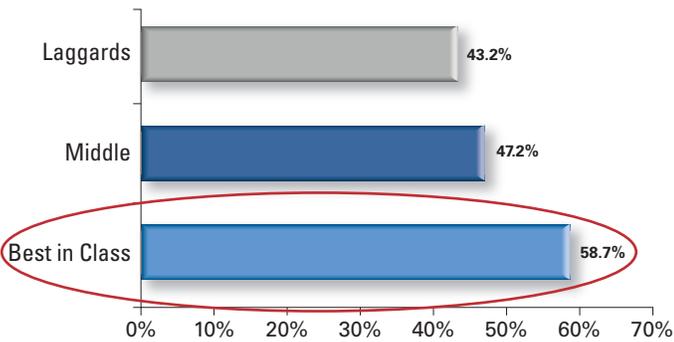


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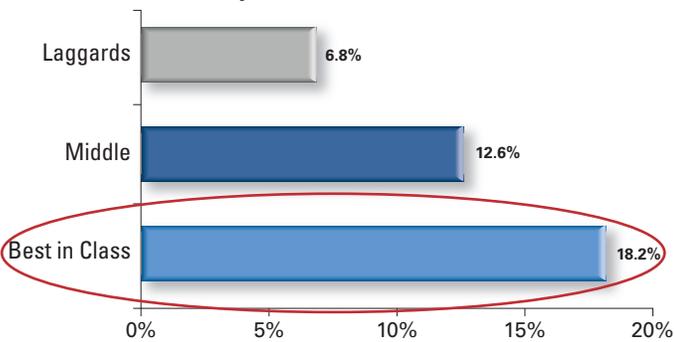
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Recommendations if OEE > 70%: Areas of Focus

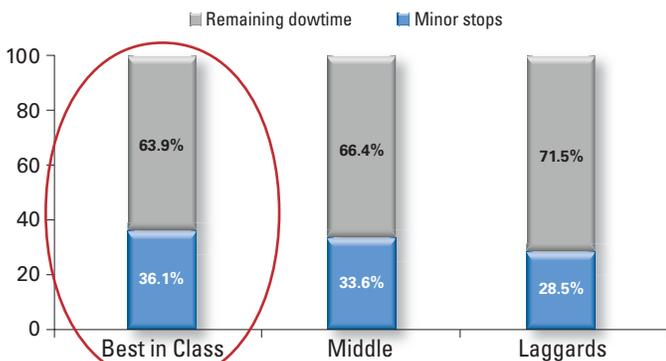
Equipment failures



Operational failures



Minor stops



Source: Informance, A Solarsoft Company

The study reveals a key insight—one size does not fit all when it comes to improving packaging line performance. Depending on where you're at in the OEE spectrum, you work on different things. A big company, for example, with 80 plants is bound to have some plants in best-in-class, and others that are laggard performers. If they issue a company-wide policy that all plants focus on equipment failures as a way of boosting OEE, that's a mistake. If a plant's OEE is greater than 70%, work on 3 things: equipment failures, operational failures, and minor stops. If a plant is in the middle of the pack, they should focus on equipment failures, operational downtime, and minor stops. Finally, if a plant is with the laggards, they should prioritize shutdowns, equipment failures, minor stops, and quality issues.

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